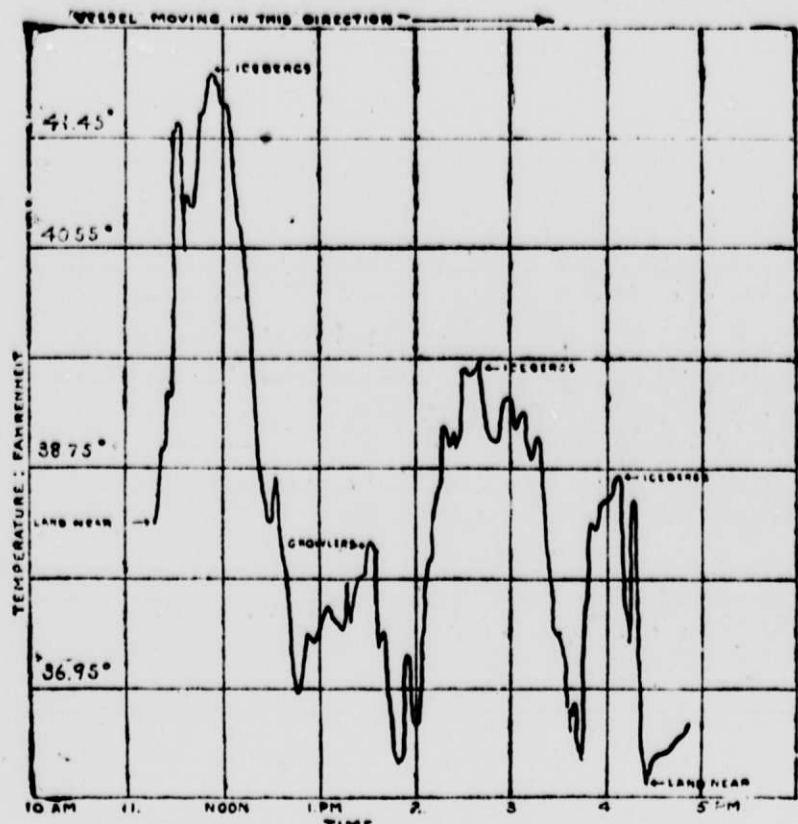


PARADOX OF ICEBERGS DECEIVED NAVIGATORS



A microthermogram record of the steamer Montcalm when approaching successive bodies of ice. Uniformly the temperature of the sea water rises as the ice is neared.

ICEBERGS are again abroad upon the North Atlantic, and the narrow escape of the steamer Teutonic is a warning to the seafarer. The close shave of the Teutonic is a repetition of conditions that are apt to be repeated at this season of the year when fogs are in abundance off the coast of Newfoundland. As a rule the iceberg is rather a rarity so late, but it is the unexpected that happens, and the size of this sinister wanderer is fair evidence that there are others of his dire kin adrift and likely to trend southward across the paths of ocean travel.

Fortunately for the Teutonic wireless messages had given warning of the proximity of ice, and equally fortunate was the fact that she was creeping along at slow speed when the berg loomed up out of its shroud of mist. The ship, as transatlantic liners go today, is relatively small, and it was possible to back her engines and to swing her clear, even though the interval between her and the menace was a short one. However, the margin of safety must have been a disturbingly narrow one, inasmuch as there was imminent danger of the liner's propeller striking the ice as she swept around and headed away from the berg. Prompt and skillful handling alone probably saved us from another marine disaster.

The Belle Isle district and the Newfoundland coast have been a threatening region to seafarers for generations, particularly because of fog and ice. The ever increasing Canadian commerce bound in and out of the St. Lawrence has felt the need of some greater measures toward security. To this end the subject of ice drift and the temperature influence of bergs upon the surrounding water have been of recent years the subjects of scientific investigation, and in this particular line of research Prof. Howard T. Barnes, a Canadian physicist, has been especially conspicuous. His studies have disclosed some strikingly novel phenomena, and these have formed the basis of practical proposals and inventions which may lead to greater safeguarding of ocean travel.

Because of the Teutonic's escape interest is renewed in the various plans

which have been proposed and developed scientifically for automatically detecting the presence of ice, and there is reason to hope that some of the apparatus will fulfill the expectations of the inventors. Most of these devices have to do with different ways of measuring the changing temperature of the sea water. They are designed to do this continually and to supply the ordinary practice on shipboard by which a bucket of water is dipped up from the ocean's surface and its temperature taken, more often than otherwise by a common deckhand. But none of these instruments is likely to be of real service unless the influence of the iceberg upon the surrounding sea is properly interpreted.

Now for the story of a seeming paradox. Thanks to Prof. Howard T. Barnes of McGill University, Montreal, there is today a new understanding of the way icebergs affect the surrounding sea water. Contrary to popular belief, these frigid bodies, instead of chilling the ocean's surface, actually seem to make the neighboring water warmer. This quite upsets the hitherto prevailing notions of the seafarer who has thought that a drop in the temperature of the sea indicated the presence of ice. You would probably hold the same opinion knowing what the lump of ice does to the contents of a tumbler.

Without going into the details of the physical characteristics of the North Atlantic, it will suffice to know that the shipping lanes traverse a section where the warm waters from the South vie ceaselessly with the cold waters of the North working irresistibly toward the equator. The cold Arctic flood is of fresher water, while the Gulf Stream journeys poleward heavily charged with its burden of salt. Because the Southern flood is warm it holds to the surface, and it does this despite its salinity; but the tax of buoying up its load of salt sometimes becomes too great for it. Keep this fact in mind. Ignorance of it has puzzled more than one seafarer, and a recent case may be cited.

A skipper feeling his way toward the eastern coast of America kept taking sea temperatures in order to make sure of when he was in touch with the Gulf Stream. Theoretically he would know

this if the ocean became markedly warmer. What, then, was his amazement when he discovered the surface water to be considerably colder than the sea a little way down. Not only did this apparently violate his knowledge of physics by putting the colder and supposedly heavier water on top of the warmer stratum, but it left him bewildered as to his whereabouts.

He reported the anomaly as he thought it to the Hydrographic Office when he reached port and asked for an explanation. He got it promptly. It was this: Even though the upper stratum was colder it was actually lighter than the warmer sub-stratum, surcharged, as the latter was, with salt in solution. Because it was slightly chilled below its local normal the Gulf Stream had dipped beneath the Arctic current.

You see nature has a wonderfully nice sense of balance, and this automatic adjusting of the sea's waters may mislead the uninformed navigator. Prof. Barnes has traced these actions so far as they relate to the iceberg, and his researches are of great importance.

Before taking up the work of the Canadian scientist, reference may be

Narrow Escape of Teutonic a Warning to Mariners—Old Practice of Trying to Detect Proximity of Ice by Taking the Temperature of the Sea Based on an Error

far back as 1911 he reported as follows upon some experiments in connection with icebergs near the Belle Isle Straits in which he used a very sensitive thermometer for temperature reading:

"As soon as the ship, the Stanley, was reported abreast of the berg direct readings were taken at one minute intervals as the mass of the ice was left astern. . . . These observations show how the temperature rises as the distance from the berg becomes greater."

In conclusion, speaking of the data obtained in the Belle Isle Straits in 1910, Prof. Barnes said:

"In the light of preliminary observa-

tion by a rapid fall below the mean temperature of the water the presence of ice may be taken as fairly assured."

It may be noted that it is a well known fact that schools of fish and other organic sea life will affect the temperature of the water.

The rather puzzling character of the observations made in 1910 induced Prof. Barnes to make additional investigations during the summer of 1912, and for the purpose the Canadian Government lent him the steamship Montcalm. Aboard of that vessel he spent three weeks in the Belle Isle Straits, and he employed his marine thermometer, which is so sensitive that it is capable of detecting temperature variations of

three currents were induced by ice melting in salt water:

First, a current of sea water chilled by the ice and sinking downward by reason of its increased specific gravity.

Second, an induced current of warm sea water moving toward the ice to fill in the preceding movement.

Third, an overlying stratum or current of light fresh water having its origin in the melting ice. This spreading away from the ice and over the denser salt water.

Prof. Barnes was at first led to believe that in his sea tests his microthermometer was affected by the third current. Naturally this lighter water would be warmer than the normal sea surface because of scattered radiation and the sun's effect, which are notably pronounced over the sea. The lighter water of the melting berg would retain its heat thus acquired because it could not easily mix with the colder salt water beneath it. Close to the iceberg, the professor imagined a fall of temperature would follow on account of the cooling influence of the surface current of fresher water.

But theory had to give way to fact, and he really discovered that an iceberg melts so slowly that substantially no dilution of the surface water could be detected even right alongside a berg. This point was not left for speculation, but was established with scientific accuracy by delicate electric measuring instruments with samples of bottled water carried back to the laboratory at McGill University. In fact, larger variations in the salinity of sea water were found to exist in the open ocean than in the neighborhood of ice. This fact may possibly be of service to inventors who are seeking to determine the presence of ice by means of the difference in the salinity of the sea; but for the present it has no bearing upon the problem as approached by the Canadian scientist.

Now, while Dr. Pettersson traced three currents by means of laboratory experiments, Prof. Barnes declares that his tests indicated that an iceberg probably produces only two currents: a cold current sinking downward, bearing with it at the same time the water from the melted ice, and a horizontal current of the surrounding sea following in toward the berg and causing the latter to melt. But you will ask how is this movement of the sea's surface going to make that water warmer than it otherwise would be? The answer is quite simple.

Normally, the cold water from the depths of the ocean circulates vertically



Local branch of the U. S. Hydrographic Office Experts mapping out an iceberg chart.

made to an incident that happened just before the Titanic went down. The steamship Etowah, bound for New York, sighted an iceberg in latitude 42 north and longitude 39 west about noon of April 12, 1912. At 4 in the afternoon one of them was quite 100 feet high and 200 feet long. Thus for hours the there were twenty bergs in view, and ship was in the proximity of ice. Yet when she was nearest to the group of bergs the sea water was found to be actually two degrees warmer than it had been three hours previously. The captain of the Etowah made this significant report:

"The Arctic current in the vicinity of this ice was normal for this neighborhood, and the ice seemed to have no apparent effect upon the water temperature."

Mariners have differed before upon this point, and out of it has grown a dangerous confusion of opinions.

Indeed, Prof. Barnes has not always held his present belief, which shows how even scientists may sometimes miss the key of the problem. Only as

the records obtained seem very promising of results which are likely to lead to valuable methods for iceberg detection at sea in time of fog.

A careful inspection of the records shows that an iceberg affects the temperature of the water in a characteristic way. The temperature first rises rapidly and then falls with great rapidity.

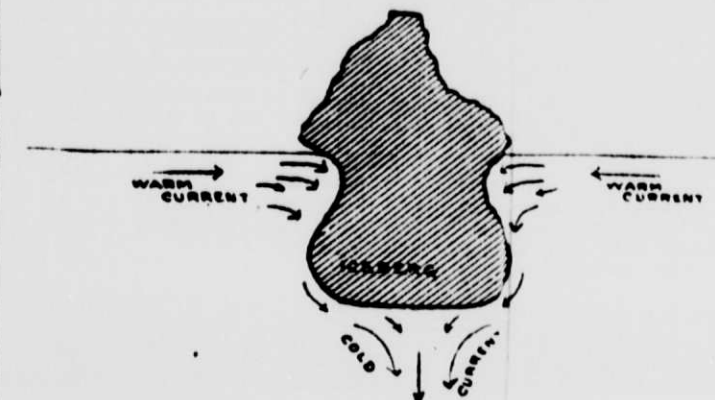
This increase in the water temperature is a new and unexpected result, and one that demands careful investigation. The explanation is at present not clear. The temperature effect may be due to the temperature reaction at the junction of the fresh surface current from the iceberg mixing with the sea water. It may also be connected with the presence or absence of definite organic life at the junction of the fresh current in salt water.

"In any case the sharp rise before the fall can be taken to indicate the entrance of a slip into the cold surface current near the berg, and thus gives a preliminary indication of the proximity of ice. Should the rise be followed

by a rapid fall below the mean temperature of the water the presence of ice may be taken as fairly assured."

When a drop of temperature was observed near the ice it was discovered to be due to the sweep of a colder northern current, in which the iceberg was being carried. Despite their great bulk, the cooling effect of the icebergs themselves was really very small. In the main Arctic current, cooler currents exist whether ice be present or not; but when a berg was approached a zone of warmer water was uniformly found to envelop it for a considerable distance. Even when within a few yards of them the icebergs investigated by Prof. Barnes in the Belle Isle Straits and in the sweep of the Labrador current showed no cooling effect upon the adjacent waters.

Remember what has already been said about warm salt water sinking when chilled. Experimentally it was shown by Dr. Otto Pettersson that



The currents in the sea created by a melting iceberg. The warm current so induced automatically tends to destroy the iceberg by attacking the body of the berg immediately below the waterline.

and thus arrives at the upper stratum and keeps the sea's surface cooler than it would be if undisturbed and exposed to the sun and the warmer air. When a surface current is artificially induced by an iceberg, this horizontal flow blankets the upward movement of the cold waters of the deep sea and leaves the surface layer so much longer

PROMISE GREATER SAFETY IN OCEAN TRAVEL

WHAT inventions, what precautions will the near or distant future provide to safeguard life at sea, to make for greater ocean safety to passengers and crew?

As though the Volturino disaster had hastened its session an international conference on safety at sea is to meet in London November 12. Every maritime nation in the world will be represented by delegates, those from the United States being Rear Admiral Washington L. Capps, Chief Constructor of the United States Navy; Naval Constructor David W. Taylor, U. S. N.; George Fisher, Supervising Inspector General of the United States Steamship Inspection Service and E. T. Chamberlain, Commissioner of Navigation.

Marconi's invention of wireless telegraphy has already saved thousands of lives at sea, in addition to those so recently rescued from the burning Volturino, and it is not unreasonable to expect that within the next twenty-five years other inventions and improvements of existing devices will revolutionize traveling by sea and give increased assurance of safety to life.

As passenger ships other than small coastwise vessels are now compelled by United States laws to be provided with wireless installation, together with competent operators, may not such ships within the next quarter of a century be required, for instance, to carry powerful hydroplanes, each capable of carrying fifty or a hundred passengers and of being launched from stages erected on the vessel's deck?

An aeroplane was successfully launched last year near San Francisco from the deck of the United States cruiser California, in smooth weather. It is true, but it may reasonably be expected that an aerial boat may be built strong enough to defy a gale. When the aeroplane first appeared thousands of sceptics declared that it might be able to sail with the wind, but never against it. Yet only last month five aeroplanes, in a competitive race, successfully made the complete circuit of the Borough of Manhattan in such a heavy wind that it was almost half a gale.

It may not be expected perhaps that a hydroaeroplane, carrying half a hundred persons or more, could successfully travel a great distance in a storm through the air or on the water, but it might well succeed in reaching some vessel and so save those who were seeking to leave a sinking ship.

It is certain that the methods of fighting fire on shipboard will be improved within a few years. It is recognized that the present systems of trying to extinguish flames by water or steam are inadequate. THE SUNDAY SUN recently explained the advantages of smothering flames by means of a gas, such as carbon dioxide, and how

the gases passing through the smokestack may be used for the purpose. Had some such method been available on the Volturino it is probable that not only would not a person have been lost but the ship herself might have been saved.

Again, all steamships carrying passengers may be compelled to be equipped with tanks large enough to carry a supply of oil to be used in calming a boisterous sea in case boats have to be lowered. When one of the rescuing steamships, the oil tanker, the Narragansett, reached the burning Volturino a gale was blowing and the seas were running mountain high, making it almost impossible for the Grosser Kurfuerst, the Kroonland, the Touraine and other ships to launch small boats to take off the Volturino's passengers. The Narragansett allowed oil from her tanks to flow into the sea. Immediately the sea near by became comparatively calm, sufficiently so that the rescuing ships were able to launch boats and take off the 521 passengers and crew.

The movement in the case of passenger ships to build a "ship within a ship," so as to afford greater safety in case of accident, began some time ago. Two instances of this construction are the Imperator, the largest passenger vessel afloat, and the Olympic, the Aquitania, now building in England, which is to exceed even the Imperator in size, is planned on the "ship within a ship" form of construction.

Already some seafaring men have suggested that a system of rescue ships shall cruise the ocean regularly within certain specified zones, winter and summer, and shall carry powerful wireless apparatus, large tanks filled with oil, hydroaeroplanes, tanks containing carbonic acid gas for fire extinguishing purposes and other means of giving aid to ships at sea. This patrol would be supported jointly by the various maritime nations.

Through such an arrangement vessels in distress would always know where to look for aid and would be sure of obtaining it at short notice.

Lewis Nixon of New York, former naval constructor of the United States navy and designer of the famous United States battleship Oregon, has deeded views on ocean safety and what the future holds in that direction.

Commenting on the Volturino disaster of a few weeks ago in particular and on ocean safety generally Mr. Nixon said last week:

"This latest calamity taken in connection with that of the Titanic shows plainly that even with adequate boat

changes will be brought about, naturally, in future ships. We may expect an extension of the double bottom up the sliding up higher of transverse bulkheads, and even a change in the long time type of watertight bulkheads, a less number of water-tight doors and a rearrangement of construction forward."

"Opinions delivered on such factors are useless, as in the general design of designers being only too glad to progress in increased safety and ample structural strength. The various devices existing, such as bell signals, cophones and wireless direction pointers will all be incorporated as they are brought into workable and efficient shape, as managements are never niggardly in providing safeguards in which they have faith. Of course, as might be expected, such managements are overwhelmed with devices having no merit except in the minds of some geniuses who rarely understand actual conditions."

"As a result of the Titanic disaster more efficient lookout service and greater regard for the comfort of the lookout man has resulted, so that he may be in the best physical shape for his work."

"Many of the ocean liners now have devices for closing bulkhead doors from the bridge and indicators giving alarm in case water rises to a certain height in any compartment, or in case the temperature should rise above a certain figure. As the advantages of such installations commend themselves to ocean travellers their use will broaden."

"If one will place the photograph of a vessel of forty years ago alongside of one of a large steamship of to-day the general similarity of above water appearance will be striking. In other words, while we have advanced in structural engineering, in machinery and in countless devices and accessories we yet expect to drive a vessel at twenty-five knots an hour keeping the same outside shape as with older vessels of twelve knots. The fast liner of today should be radically different in topside design, and in the changed shape to adapt great bulks for rapid driving in heavy seas we shall see greater consideration paid to launching boats."

"Every one of course now knows that in an ordinary crew there are not a great many men skilled in launching and handling afloat the ordinary lifeboat. This should not be considered a plea for further legislation, even more strongly handicapping the carrying of our flag on the sea. The men now employed are in response to a demand and we must in a measure adjust our appliances to the men who are to handle them."

"Let us see what happened on the Volturino. The main trouble was in the smashing of boats against the side of the ship. Now what is the remedy? Plainly a design of boat that will not smash."

"Is this possible? Only a few days

ago I went over to the Wehn davit works to see some new boats being built for the United States navy. They will not crash, no matter how hard they are thrown against the side of a vessel, while in the same space that is allowed for ordinary lifeboats far more passengers can be carried. So we see that every lesson is drawn upon for new devices making travel safer, and that every capable of appreciating such lessons are at work at all times."

"Of course all ocean-going steamers should be provided with searchlights. The splendid work done by Capt. Barr of the Carmania at the time of the Volturino disaster was masterly and worthy of all praise."

"To one man now on the total crew list carried on an ocean liner who can handle an oil tank we shall find ten who can handle a modern gasoline engine, so universal has knowledge of the manipulation of motors in boats, as in automobiles, become. All passenger vessels must in the future carry motor boats. They can keep other lifeboats head to the sea and can be far more easily handled than the rowboat."

"Any one familiar with the development in the boats of the United States life saving service can appreciate the vast superiority of the new motor life saving boat over the old driven boat, both in the matter of general efficiency and in the nursing of the physical strength of the crew for supreme effort. Gasoline for motor boats can be carried on shore in oil tanks and cannot be of the slightest danger. A very serious evil might be incurred in case oil burning engines were substituted for the universally understood petrol motor, whose manipulations are of the simplest kind."

"To sum up, however, the whole matter resolves itself into the fact that those who go down to the sea in ships must take a certain amount of risk and realize that while a vessel lying at a dock may seem an immense structure when at sea he becomes very much of a pipsy, and that the ocean's greatness is overwhelming and cannot be altogether conquered by man."

"Hence, while outside influence may in some measure aid in safeguarding ships and passengers the wisest provisions for safety will be those devoted to making the vessel itself as secure as possible in operation."

"Any expectation that accident on the sea may be altogether averted, either in the near or distant future, through the agency of man is as futile as is the hope that accidents on land may be entirely avoided. Accidents ashore and afloat always have happened and doubtless always will. Although man's ingenuity may, without question will, as time advances, lessen their extent and frequency, but the overwhelming powers of nature as compared to the puny efforts of man and the percentage of chance will never altogether remove the possibility of accident anywhere."

Whitman Rebukes Fusion For Slanders Against Judge McCall

District Attorney Says He Has No Sympathy With A Campaign Of Mud-Slinging Against An Honest Man.

District Attorney Whitman, in a speech which he delivered at the Fusion Meeting in Madison Square Garden on the night of October 30, took occasion to tell the Fusion managers that he had no patience with a campaign of slander and vilification. In the morning papers of October 31, Mr. Whitman was quoted as follows:

"I believe that Judge McCall is an honest man. I have been a lawyer in New York for twenty years, and in four years of that time I have been the District Attorney of this county. I or my representatives have appeared before Judge McCall day in and day out, and I should despise myself if I should stand here and condemn or vilify a man as I have known him and who has been above suspicion."

"I do not have any patience with vituperation, vilification, or such things in a campaign. This business of 'You are a liar' and such has no sympathy from me."

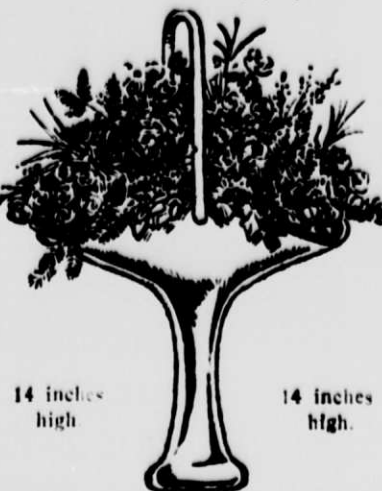
To vote for McCall and Whitman put your cross (X) in the circle under the Star.

BROOKLYN ADVERTISEMENTS.

\$2.00—Value \$3.50.

Elegant Christmas or Wedding Gift.

For this Hanging Basket, made of solid brass; highly polished; filled with an assortment of fine ferns and flowers, made of linen, chemically prepared.



14 inches high 14 inches high.

Other bargains in Furniture, Carpets, Housefurnishing Goods, etc.

Grand Rapids Furniture and Selling Agents for Carpets—at Low Prices.

MASON'S

Doing Business 70 Years

On Corner Myrtle Avenue and Bridge Street.

BROOKLYN, N. Y.

\$1 MADE

COUPON NO. 6.

Cut this out and send \$1 with it. We will send you a Basket with flowers. This is a bona fide offer—the loss being charged to advertising. The reputation of the Mason house is sufficient guarantee that the basket will be sent as advertised by Parcel Post free.